

Amendments to the Claims

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

Claims 1-12 Cancelled.

13. (Currently Amended) A single polarizer image display projector comprising:

an image processing circuit for scaling processing of an image;

a  $\gamma$  correction circuit for subjecting a color to  $\gamma$  correction to obtain a color suitable for a display on a display panel;

a panel drive circuit for driving the display panel;

a color switch for selecting a color with a specific color tone to be displayed; and

a color switch drive circuit for driving the color switch, the color switch drive circuit comprising:

a mean luminance calculation circuit for calculating  
determining the mean luminance of picture element data  
outputted from the image processing circuit; and

a white/black color insertion timing control circuit  
for receiving triggers for R, G and B colors,  
respectively, and generating a white/black color  
insertion timing signal, wherein the white/black color  
insertion timing control circuit, in response to the R, G  
and B triggers and white/black color insertion timing  
signal, generates a color information signal that  
synchronizes with each trigger, with each synchronized  
period of the color information signal comprising a  
sequence of signal components, including an R, G or B  
color information signal component corresponding to the

synchronized trigger in sequence with a white/black color information signal component derived from the mean luminance of the picture element to be displayed means ~~for inserting a white color or black color among displayed gradations of R, G and B lights according to the value of the mean luminance to expand the dynamic range for image display.~~

14. (Previously Presented) The single polarizer image display projector of Claim 13, wherein the panel drive circuit generates triggers for R, G and B lights to drive the color switch so that a color tone display on the display panel and coloring by the color switch can be synchronized with each other.

15. (Previously Presented) The single polarizer image display projector of Claim 13, additionally comprising means for selecting and inserting white color when the mean luminance of the picture element to be displayed is greater than a criterion of about 50% and selecting and inserting black color when the mean luminance of the picture element to be displayed is less than the criterion so that the contrast is improved.

16. (Previously Presented) The single polarizer image display projector of Claim 13, additionally comprising means for controlling the timing of the insertion of the white color or black color according to the mean luminance of the picture element to be displayed, thereby not only improving the purity of the white color or black color but also maintaining the purities of other colors as high as possible.

17. (Currently Amended) The single polarizer image display projector of Claim 13, wherein the color switch drive circuit comprises a RGB/Y conversion circuit for converting R, G and B signals to Y signals, ~~a mean luminance calculation~~

~~circuit for calculating the mean luminance of the picture element to be displayed, a white color/black color insertion timing control circuit for generating a white color/black color insertion timing signal~~ and a D/A conversion circuit for converting the output of the white color/black color insertion timing control circuit to an analog output, whereby the triggers for the R, G and B colors are outputted respectively to the white color/black color insertion timing control circuit so that the white color/black color insertion timing control circuit is able to output color information corresponding to and synchronized with each trigger and matching with the first half of the trigger and outputting white color or black color information according to the mean luminance of the picture element to be displayed and matching with the latter half of the trigger.

18. (Previously Presented) The single polarizer image display projector of Claim 13, wherein the color switch drive circuit comprises a RGB/Y conversion circuit for converting RGB signals to luminance signals, a mean luminance calculation circuit for determining the mean luminance of the picture element to be displayed, a white color/black color insertion timing control circuit for generating a white color/black color insertion timing signal and a D/A conversion circuit for converting the output of the white color/black color insertion timing control circuit to an analog output, whereby each of the triggers for the R, G and B colors is outputted by a RGB trigger generating means responding to a single trigger outputted from the panel drive circuit and the white color/black color insertion timing control circuit generates an output timing signal for each of the R, G and B colors according to each of the triggers for the R, G and B colors so that white color information or black color information can be outputted according to the mean luminance of the picture element to be displayed.

19. (Previously Presented) The single polarizer image display projector of Claim 17, wherein, in outputting color information corresponding to the trigger, a voltage output from the D/A conversion circuit is controlled according to the mean luminance of a picture element to be displayed to control the transmittance of the color switch and improve the contrast.

20. (Previously Presented) The single polarizer image display projector of Claim 18, wherein, in outputting color information corresponding to the trigger, a voltage output from the D/A conversion circuit is controlled according to the mean luminance of a picture element to be displayed to control the transmittance of the color switch and improve the contrast.

21. (Previously Presented) A single polarizer image display projector comprising: an image processing circuit for scaling processing of an image; a  $\gamma$  correction circuit for subjecting a color to  $\gamma$  correction to obtain a color suitable for display on a display panel; a panel drive circuit for driving the display panel; a color switch for selecting a color with a specific color tone to be displayed; and a color switch drive circuit for determining the mean luminance of picture element data outputted from the image processing circuit so that a white color or black color can be inserted among displayed gradations of R, G and B lights according to the value of the mean luminance to expand the dynamic range for image display, the color switch drive circuit comprising a RGB/Y conversion circuit for converting R, G and B signals to Y signals, a mean luminance calculation circuit for calculating the mean luminance of the picture element to be displayed, a white color/black color insertion timing control circuit for generating a white color/black color insertion timing signal, the white color/black color insertion timing control circuit comprising a first counter for counting the

pulse width of a trigger signal, a second counter for counting and detecting an assert position of the trigger signal, a ratio calculator for varying the pulse width counted by the first counter according to the mean luminance of the picture element to be displayed, a W/B selector for selecting either white color or black color according to the mean luminance of the picture element to be displayed, a pulse generator for asserting the pulse width determined by the ratio calculator at the timing of the counting by the second counter and an output control circuit for selecting color information corresponding to the trigger signal or white color or black color information corresponding to the timing signal generated by the pulse generator, and a D/A conversion circuit for converting the output of the white color/black color insertion timing control circuit to an analog output, whereby the triggers for the R, G and B colors are outputted respectively to the white color/black color insertion timing control circuit so that the white color/black color insertion timing control circuit is able to output color information corresponding to and synchronized with each trigger and matching with the first half of the trigger and outputting white color or black color information according to the mean luminance of the picture element to be displayed and matching with the latter half of the trigger, thereby enabling the white color or black color information to be inserted and improve the contrast.

22. (Previously Presented) A single polarizer image display projector comprising: an image processing circuit for scaling processing of an image; a  $\gamma$  correction circuit for subjecting a color to  $\gamma$  correction to obtain a color suitable for display on a display panel; a panel drive circuit for driving the display panel; a color switch for selecting a color with a specific color tone to be displayed; and a color switch drive circuit for determining the mean luminance of picture element data outputted from the image processing

circuit so that a white color or black color can be inserted among displayed gradations of R, G and B lights according to the value of the mean luminance to expand the dynamic range for image display, the color switch drive circuit comprising a RGB/Y conversion circuit for converting R, G and B signals to Y signals, a mean luminance calculation circuit for calculating the mean luminance of the picture element to be displayed, a white color/black color insertion timing control circuit for generating a white color/black color insertion timing signal, the white color/black color insertion timing control circuit comprising a first counter for counting the pulse width of a trigger signal, a second counter for counting and detecting an assert position of the trigger signal, a ratio calculator for varying the pulse width counted by the first counter according to the mean luminance of the picture element to be displayed, a W/B selector for selecting either white color or black color according to the mean luminance of the picture element to be displayed, a W/B selector for selecting either white color or black color according to the mean luminance of the picture element to be displayed, a pulse generator for asserting the pulse width determined by the ratio calculator at the timing of the counting by the second counter and an output control circuit for selecting color information corresponding to the trigger signal or white color or black color information corresponding to the timing signal generated by the pulse generator, and a D/A conversion circuit for converting the output of the white color/black color insertion timing control circuit to an analog output, whereby each of the triggers for the R, G and B colors is outputted by a RGB trigger generating means responding to a single trigger outputted from the panel drive circuit and the white color/black color insertion timing control circuit generates an output timing signal for each of the R, G and B colors according to each of the triggers for the R, G and B colors so that white color information or black color information can be outputted according to the mean luminance of the picture

element to be displayed, thereby enabling the white color or black color information to be inserted and improve the contrast.

23. (Previously Presented) The single polarizer image display projector of Claim 18, wherein the RGB trigger generating means comprises an assert timing register capable of freely setting an assert position and a negate timing register capable of freely setting a negate position, whereby, trigger signals can be generated by counting these freely settable registered values and clocks from a vertical synchronizing signal.

24. (Previously Presented) The single polarizer image display projector of Claim 18, wherein the RGB trigger generating means comprises an assert timing register capable of freely setting an assert position and a pulse width register capable of freely setting an active pulse width, whereby the trigger is asserted by counting the freely settable registered values and a clock from a vertical synchronizing signal and a trigger signal is negated by counting the number of clocks registered with the pulse width register and the clocks.

25. (Previously Presented) The single polarizer image display projector of Claim 17, wherein, in outputting color information corresponding to the trigger, while voltage from the D/A conversion circuit is controlled, insertion timing of the white color or the black color is controlled, whereby not only the contrast and purity of the white color and black color can be improved, the purities of other colors can also be maintained as high as possible.